

Characterization of magnesium orotate-loaded chitosan polymer nanoparticle for drug delivery system

ABSTRACT

The drug release properties of magnesium orotate (MgOr) encapsulated in the chitosan (CS) cavity and the complexation behavior between MgOr and CS were investigated. The MgOr-loaded CS nanoparticles (MgOrCSNPs) were characterized by differential scanning calorimetry, Fourier transform infrared spectroscopy, X-ray diffraction, transmission electron microscopy, and scanning electron microscopy with energy-dispersive X-ray spectroscopy. MgOr was successfully encapsulated into the CS cavity. Results with 3-(4,5-dimethylthiazol-2-yl)2,5-diphenyl tetrazolium bromide indicated that MgOrCSNPs retained their cytotoxic activity against the liver cancer cell line (HepG2) and breast cancer cell line (MCF-7), and low toxicity against the human cell line (3T3) and human retinal epithelial cell line (ARPE-19).

Keyword: Chitosan; Drug delivery; Encapsulation; Magnesium orotate; Nanoparticles